SECTION 4

UNSTABILISED POWER SUPPLIERS PS3/4 AND PS3/4A

4.1 Introduction

The unstabilised h.t. power suppliers coded PS3/4 and PS3/4A are designed to be used with the voltage stabilising units coded PS2/1, PS2/2, PS2/1A and PS2/2A described in Part 2, Section 1. The two units differ only in output voltage and maximum load current, as detailed below.

(*a*) *PS3/4* This will deliver a maximum load current of 1 ampere, and at that current the output is approximately 250 volts. It is used with the PS2/1 and PS2/2 stabilisers to provide a voltage-regulated power supply at 200 volts. Each PS3/4 unit will feed one PS2/1 and one PS2/2 stabilisers, or three PS2/2 stabilisers.

(*b*) *PS3/4A* This has been designed to deliver a maximum load current of 800 milliamperes, and at that current the output is approximately 300 volts. It is intended for use with the PS2/1A and PS2/2A stabilisers if a voltage-regulated supply at 250 volts is needed. Each PS3/4A unit will feed one PS2/1A or two PS2/2A stabilisers.

The output circuits are isolated from earth and at the output terminals the hum voltage is approximately 1 volt d.a.p. at full load current. The units are unsuitable for the supply of unstabilised power direct to other equipment.

Each unit is constructed on a CH1/3 plug-in chassis and all input and output connections are made in a 24-way plug at the rear.

The rectifiers are a silicon junction type and, although operated below their maximum ratings, the fullest possible ventilation must be provided for them to avoid overheating.

4.2 Circuit Description (Fig. 4.1)

Fig. 4.1 is the circuit diagram of the PS3/4 and the PS3/4A. The circuit comprises a transformer T1 having secondary tappings at 300 volts and 375 volts, four rectifiers MR1, MR2, MR3, MR4, in a full-wave bridge circuit, and a single-section inductor-input filter L1, C2, C3, C4. In the PS3/4 the rectifiers are fed from the 300-volt transformer tapping; the PS3/4A uses the 375-volt tapping. There are no other circuit differences between the two units.

The inductor L1 is tuned to the ripple frequency of 100 c/s by the capacitor C1. Resistors R1, R2 damp the tuned circuit so that resonance is obtained without the need of close-tolerance components for C1 and L1. Resistors R3, R4 allow the smoothing capacitors to discharge quickly, for safety, if the load on the supplier is disconnected suddenly.

As either the positive or the negative side of the output may be earthed, fuses are provided in both sides. These fuses, FS3, FS4, and the mains fuses FS1, FS2 are anti-surge types and are located at the rear of the chassis. Access to them is obtained by withdrawing the chassis from the rack.

Socket A and multiplier resistor R6 enable the output voltage to be checked with a Portable Test Meter ME15/3P.

4.3 Regulation

The output voltages should be measured with the units on load, using a high-impedance voltmeter such as a Model 8 Avometer or a valve voltmeter, and should be within 5 per cent of the figures below.

Load current	*Volts out*	
	PS3/4	*PS3/4A*
1 A	248	—
900 mA	252	—
800 mA	255	322
700 mA	259	326
600 mA	263	331
500 mA	266	335
400 mA	270	340
300 mA	274	344
200 mA	278	349
100 mA	285	354

The approximate no-load output voltages should be 365 volts (PS3/4) and 448 volts (PS3/4A).

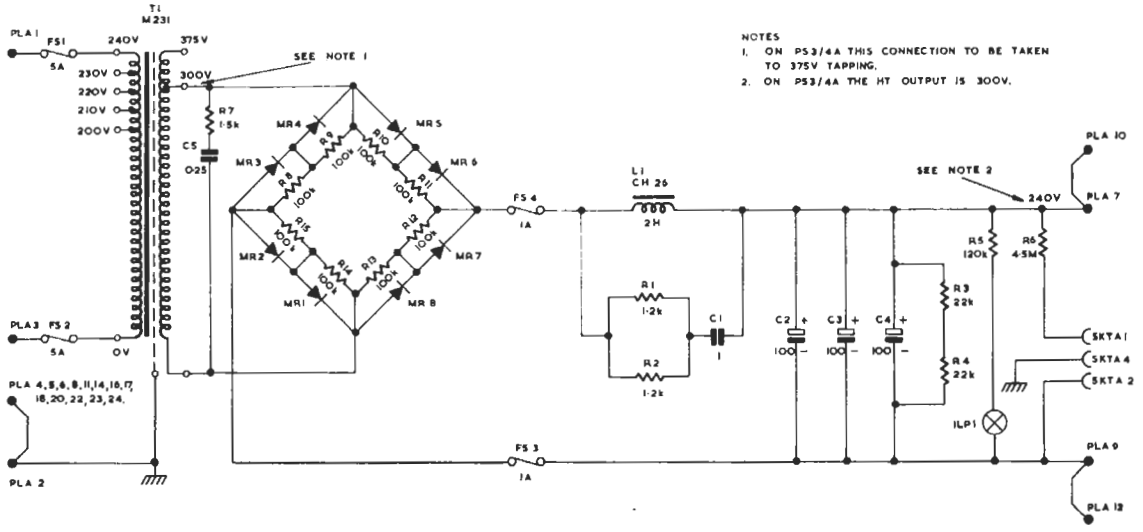
4.4 Hum

Hum should be measured by connecting a high-impedance oscilloscope across the output terminals, keeping the leads as short as possible, and with one output terminal earthed. Hum should not exceed 1·5 volts d.a.p. at maximum load current.

AMD. 460

FIG. 4.1

(ALSO IN V4)



COMP	TYPE	TOLERANCE %	COMP	TYPE	TOLERANCE %
C1	DUBILIER B 209		R1	PAINTON P 301A	5
C2	PLESSEY CE 8045/1		R2	PAINTON P 301A	5
C3	PLESSEY CE 8045/1		R3	PAINTON P 302A	5
C4	PLESSEY CE 8045/1		R4	PAINTON P 302A	5
C5	DUBILIER B 149		R5	ERIE 9	10
			R6	PAINTON 76	2
MR1	PLESSEY 6G 8		R7	PAINTON P 301 A	5
MR2	PLESSEY 6G 8		R8	PAINTON P 302A	5
MR3	PLESSEY 6G 8		R9	PAINTON P 302A	5
MR4	PLESSEY 6G 8		R10	PAINTON P 302A	5
MR5	PLESSEY 6G8		R11	PAINTON P 302A	5
MR6	PLESSEY 6G 8		R12	PAINTON P 302 A	5
MR7	PLESSEY 6G 8		R13	PAINTON P 302 A	5
MR8	PLESSEY 6G 8		R14	PAINTON P 302 A	5
			R15	PAINTON P 302 A	5

UNSTABILISED POWER SUPPLIERS PS3/4 & PS3/4A: CIRCUIT